US Army Medical Research and Materiel

Technology Available for Licensing

Vaccine Against Staphylococcus Intoxication

Features and advantages:

- **Provides recombinant vaccines and methods for use, for *Staphylococcus aureus***
- **Mutant SEA-replicon shows high level expression of both bacterial proteins**
- **Mice immunized with the mutant SEA-replicon produced high specific antibody titers and were [illegible] intraperitoneally with wild-type SEA**

The most common cases of food poisoning are caused by the bacterium *Staphylococcus aureus*. Exotoxins (also called enterotoxins) cause disease by binding to the major histocompatibility complex (MHC) on T-cells which results in the release of large amounts of various cytokines. One such exotoxin is known as SEA.

This invention provides vaccines that induce an immune response protective against intoxication with *Staphylococcus aureus*, and specifically utilizes a mutant SEA exotoxin produced by *Staphylococcus aureus*. A mutant SEA is cloned into a Venezuelan equine encephalitis (VEE) virus vector. The result is a self-replicating RNA molecule, a replicon, that encodes its own replicase and transcriptase functions, while making abundant quantities of mRNA encoding the mutant SEA exotoxin. When replicon RNA is transfected into eukaryotic cells (preferably along with helper RNAs that express VEE structural proteins), the replicon RNA is packaged into VEE virus-like particles by the VEE virus structural proteins. Since the helper RNAs lack packaging signals necessary for further propagation, the resulting virus replicon particles (VRPs) are infectious for [illegible]gle but are defective thereafter. Upon infection of [illegible]idual cell with a VRP, an abortive infection [illegible]n which the infected cell produces the mutant SEA exotoxin in abundance, and is ultimately killed by [illegible] does not produce any viral progeny.

Patent Status

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